



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# Center for Agricultural Policy and Trade Studies North Dakota State University

## AGRICULTURAL POLICY BRIEF

No. 19

September 2008

### How Long Will the Agricultural Boom Last?

*Richard D. Taylor and Won W. Koo\**

Net farm income has been at historical levels during the past three years, but there is a dark cloud hiding beneath. According to the North Dakota Farm and Ranch Business Management Education program, production costs increased from \$136.59 per acre in 1997 to \$231.06 per acre in 2007, an increase of 69%. Production costs have increased much faster in recent years. The increase was 36% between 2004 and 2007. There has been a change in the crop mix of higher cost row crops such as corn and soybeans in North Dakota since 1997, but the crop mix has been stable since 2004. Recent popular press releases have focused on fuel and fertilizer price increases, but there tends to be a general increase in all expenses. This study tries to shed light on the rising cost of production, estimate future cost increases, and analyze the impacts on net farm income.

For this study, production costs are divided into 8 categories: fertilizer, land, chemicals, repairs, interest, fuel, insurance, and other. Figure 1 shows the growth of each category and total cost since 2004. The 2007 data is actual while 2008 and 2009 are projections from the North Dakota Representative Farm Model. Total expenses in 2004 for an average profit farm in North Dakota was \$224 thousand. Total costs have increased to more than \$400 thousand by 2007.

Estimated production costs are over \$450 thousand for 2008 and over \$525 thousand in 2009. Each category also appears to be increasing throughout the entire time period. Average farm size has increased from 1,729 acres in 2004 to 1,819 acres in 2007. Table 1 shows the per acre production cost by categories. Total production costs were about \$171 per acre in 2004, but increased to \$231 per acre in 2007. It is estimated that those costs will continue to increase to \$255 per acre in 2008 and \$286 per acre in 2009. The largest increase between 2004 and 2008 has been in fertilizer costs, from \$18.05 per acre to \$37.56, an increase of 108%. Fuel has increased over 76%, while interest, chemicals, and insurance have all increased over 60% during the same time period. Total production expenses have increased over 49% between 2004 and 2008.

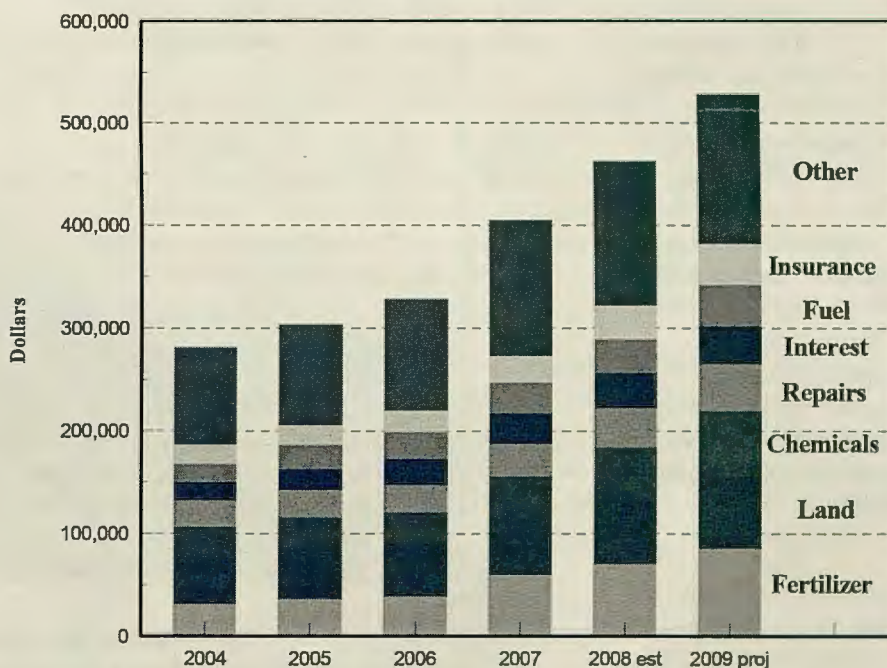


Figure 1. Change in North Dakota Farm Expenses, 2004-2009 projection

\*Professor and Director, and Research Scientist, respectively, in the Center for Agricultural Policy and Trade Studies in Fargo, North Dakota

Table 1. Per Acre Expense for North Dakota Farms by Category.

	2004	2005	2006	2007	2008 Est	2009 Est	% Change from 2000-2008
	----- dollar/acre-----						
Fertilizer	18.05	20.95	22.02	32.76	37.56	45.07	108.10
Land	33.47	34.18	34.98	36.49	40.48	44.53	20.94
Chemicals	17.07	18.57	18.33	22.78	27.84	33.96	63.11
Repairs	14.83	15.70	14.96	17.84	20.60	23.69	38.94
Fuel	9.98	13.58	14.92	16.18	17.63	21.16	76.75
Interest	10.88	11.77	14.69	16.54	18.05	19.68	66.00
Insurance	10.55	10.88	11.68	14.29	17.19	20.63	62.94
Other	56.07	57.54	62.44	74.18	75.99	77.51	35.53
Total	170.88	183.17	194.02	231.06	255.34	286.23	49.43

The fuel and fertilizer cost depends directly upon energy prices. If energy prices fall, fuel costs will fall quickly, followed shortly by fertilizer costs. However, other costs will continue to increase or remain high for several years. The cost structure that is being built into agriculture today is tolerable because of the current high commodity prices. If those commodity prices return to normal long term averages, current levels of income will be difficult to maintain. Land costs, insurance expenses, and interest along with many expenses in the other categories will remain at current levels for many years regardless of which direction commodity prices follow.

Two scenarios were evaluated because of widely different projected commodity prices, (2008 North Dakota Agricultural Outlook: Representative Farms, 2008-2017). Figure 2 shows total production expenses and net income for the average profit representative farm for 2004 through 2009.

The years 2004 through 2007 are actual data, while 2008 and 2009 are based on estimated expenses and returns. The Global

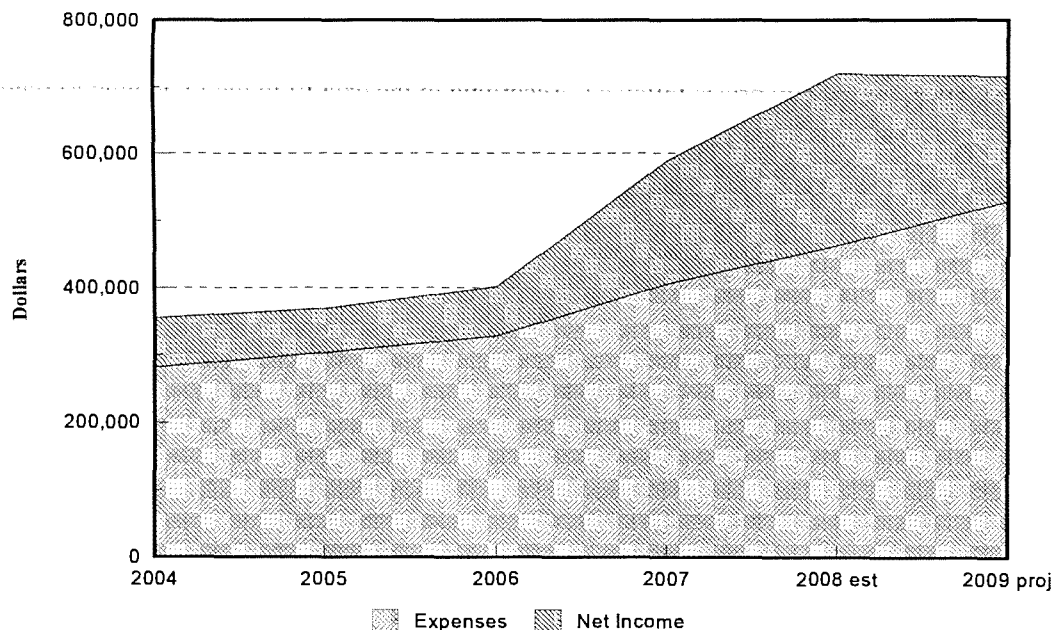


Figure 2. North Dakota Net Farm Income and Total Expenses:GWPSM Scenario, 2004-2009 estimates

Wheat Policy Simulation Model (GWPSM) scenario uses commodity prices obtained from the GWPSM operational at the Center for Agricultural Policy and Trade Studies (CAPTS), while the FAPRI scenario used prices forecasted by Food and Agricultural Policy Research Institute. FAPRI's forecasted prices are much lower than GWPSM prices. For example, 2008 North Dakota prices under the FAPRI scenario are \$6.64 for wheat, \$3.82 for corn, and \$8.95 for soybeans. The 2008 North Dakota prices under GWPSM scenario are \$7.45 for wheat, \$4.77 for corn, and \$12.36 for soybeans. Current new crop bids are \$8.30 for wheat, \$6.80 for corn and \$14.61 for soybeans, indicating that the GWPSM forecasts maybe nearer to that average price in 2008 than the FAPRI forecasts. Under the GWPSM scenario, net farm income in 2008 should remain strong

as shown in Figure 2; in fact, increasing over 2007 levels. However, in 2009, net farm income should fall due to the leveling of gross returns and the continued increases in expenses. Commodity price levels in 2009 are similar to 2008 levels. Figure 3 shows the net farm income under the FAPRI scenario. Gross returns for 2008 and 2009 are similar to that of 2007, indicating that under increasing expenses, net farm income would fall.

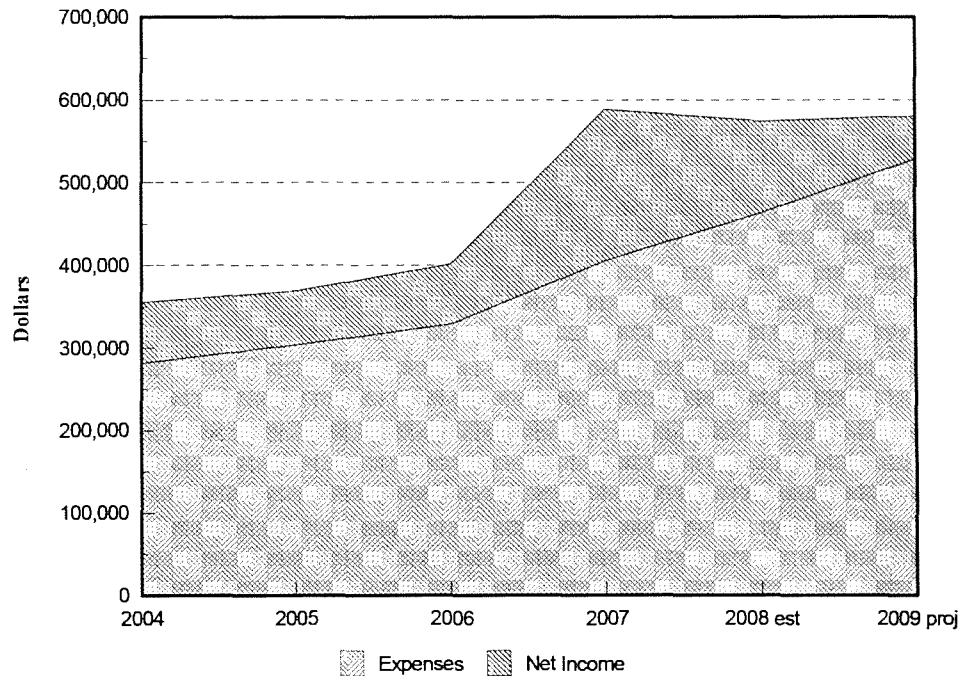


Figure 3. North Dakota Net Farm Income and Total Expenses: FAPRI Scenario, 2004-2009 estimates

The last substantial increase in commodity prices occurred in 1973-74 due to the Russian grain deal. Prices increased from \$1.76 per bushel for wheat in 1972 to \$3.95 per bushel in 1973.

All other commodity prices followed. According to the data from the Economic Research Service, total net farm income in North Dakota increased from \$609 million in 1972 to \$1.54 billion in 1973. That increase was followed by net farm incomes of \$838 million, \$359 million and \$184 million in 1974, 1975, and 1976, respectively. While net farm income fell 77% between 1973 and 1976, total expenses increased 67%. Examples of the increases are 118% for fertilizer, 111% for fuel, 92% for chemicals and 58% for interest costs. Expenses continued to increase through 1983 to 167%, before falling in 1984. By 1983 expenses had increased 131% for fertilizer, 336% for fuel, 366% for chemicals, and 463% for interest.

The value and cash rents for North Dakota farmland follows commodity prices. In 1973, the average price of North Dakota farm land was \$108 per acre with average cash rents of \$11.50 per acre. The price had risen to \$236 per acre with cash rents of \$25.00 per acre by 1976. In 1982, average land values in North Dakota reached a peak of \$436 per acre before falling to \$414 per acre in 1983. Cash rent increased to \$32.60 per acre in 1983. However, the land value had fallen 31% from its peak in 1982, \$303 per acre in 1987. Cash rents also had fallen significantly; 23% to \$25.20 per acre by 1990. Recent increases in land values and cash rent could be following the early stages of the 1973-74 increase.

Average cash rents in North Dakota were \$33.47 per acre with a land value of \$468 per acre in 2004. Cash rents increased only 4% by 2006 while land values increased 22%. In 2008, cash rents were 22% higher than in 2004 and land values were 60% higher than in 2004. Land values and cash rents more than tripled between the 1970s and early 1980s. If history repeats itself, average cash rents in North Dakota could reach \$90 per acre with average land values of \$1,400 by early 2010s.

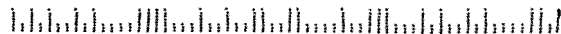
Total agricultural production value decreased 25% between 1973 and 1976. However, in 1983, total agricultural production in North Dakota had returned to the 1973 levels, but increased expenses had reduced net incomes by 81%. Expenses tend to follow prices on the way up but they do not follow prices when they fall. The current high prices will not last forever, but if history repeats itself, these increasing expense levels may increase further or remain high.

North Dakota State University  
Dept. of Agribusiness & Applied Economics  
P.O. Box 5636  
Fargo, ND 58105-5636

NON-PROFIT  
ORGANIZATION  
U.S. POSTAGE  
PAID  
FARGO, ND  
PERMIT NO. 818

Louise Letnes  
Waite Library, Dept of Applied Econ.  
University of MN  
1994 Buford Avenue -232 ClaOff  
St Paul, MN 55108-6040

55108#6040 0028



Even if commodity prices remain at current levels, agricultural expenses may continue to increase until net farm incomes for the average farm in North Dakota will return to normal levels. Long term average net farm income (2003-2007) in The North Dakota Farm and Ranch Business Management Education Program was about \$60,000. Last year that average was about \$190 thousand. Under the GWPSM scenario, net farm income for 2009 would be \$187 thousand and under the FAPRI Scenario net farm income would be \$52 thousand in 2009. If prices remain constant and expenses continue to increase at current rates, net farm income could decrease further in the future.

In sum, we have been experiencing high prices of agricultural commodities for the last two years. The question is how long will these prices last? According to past experience, the high prices should stimulate the production of agricultural commodities in the United States and other countries, resulting in a gradual decline in prices. On the other hand, input prices increase proportionally for the period. Viewing the recent past, expenses tend to decline much slower than commodity prices. This resulted in a sharp decline in net farm income for the 1973-1980 period.

We may experience the same situation as that of the 1973-1980 period for the next few years. However, this time, most input prices may continue to increase as higher energy costs filter through the entire economy. Commodity prices will not remain at these levels indefinitely which will lead to lower net farm incomes in the future.